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U.S. GEOLOGICAL SURVEY DIGITAL DATA SERIES DDS-35

Digital Map Data, Text, and Graphical Images in Support of the 1995 National
Assessment of United States Oil and Gas Resources

Compiled by
William R. Beeman, Raymond C. Obuch, and James D. Brewton

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CONTENTS

Disclaimers

System Requirements

Instructions and Documentation for DDS-35

 Introduction

 Viewer Programs

 Other Programs

 Overview of the CD-ROM Structure

 Data Overview

 Map Data

 Text Data

 Chapters

 Gas Hydrates Data

 Regional Descriptions

 Province Descriptions

 Stratigraphic Columns

 Credits

 References Cited

 Appendix A. Region and Province Names

 Appendix B. Chapter File Names

 Appendix C. Directory Tree Structure

 Appendix D. Outline of DDS-30

 Appendix E. Explanation of the Mapping Strategy Used in Plays 5801, 5804,
 5812, and 6101

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data and related materials and (or) the functioning of the software. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the USGS in the use of this data, software, or related materials.

SYSTEM REQUIREMENTS

The data and text on this CD-ROM require either (1) a Macintosh running System 7 or later and having a 13-inch color monitor and CD-ROM drive or (2) a PC running DOS 5.0 or later and having a VGA color monitor and CD-ROM drive. The Macintosh should have at least 8 megabytes of RAM. The PC system should have at least 4 megabytes of RAM and a 386 processor or better. The map and image viewing programs contained on this CD-ROM are PC-based only. Instructions for obtaining shareware Macintosh-based viewing programs are included in the documentation for DDS-35.

INSTRUCTIONS AND DOCUMENTATION FOR DDS-35

By

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INTRODUCTION

This CD-ROM releases digital map data, figures, and text used in the "1995 National Assessment of United States Oil and Gas Resources -- Results, Methodology, and Supporting Data," U.S. Geological Survey Digital Data DDS-30 (Gautier and others, 1995) in such a way that the maps and text may be printed by computer users from their own systems. Because of the number and variety of mapping and word processing programs available, we have provided the data in a raw form, by latitude and longitude for the maps, and in both formatted text (ans) and rich text format (rtf) for the geologic descriptions. For the maps, the production data (cell data) are represented by files with a .cls extension and the line data are represented by files with a .lin extension. Text of the various geologic descriptions can be printed directly from many computer operating systems, such as UNIX, VMS, Macintosh, and Microsoft DOS. The rich-text format, which retains the original fonts and text attributes, must be imported into a word-processing program that supports that format. Not included in this CD-ROM are the statistical graphs; tabular data, including estimates, by play; and the province index maps. These data can be found on DDS-36 (Charpentier and others, 1996). Estimates by province, region, type of accumulation, and totals are provided in the executive summary of results (execsum.ans and execsum.rtf).

Macintosh users will note that box-shaped characters appear at the beginning of each line of text and (or) data when viewed by applications such as TeachText. These characters are linefeeds that are needed by DOS applications. The linefeed characters can be removed with a text editor or word processor by searching for and deleting "control-j" characters.

The map data and geologic text released on this CD-ROM are nonproprietary in nature. Certain map data, reservoir information, and geologic descriptions are not included either on this CD-ROM or on DDS-30 because they are considered proprietary by the database vendors, NRG Associates, Inc., and Petroleum Information Corporation, or other third-party entities such as the Energy Information Administration. Proprietary data cannot be released to the public.

This file ("Instructions and Documentation for DDS-35," having file names readme.ans or readme.rtf) contains five appendixes: Appendix A lists region and province numbers and names. Appendix B is a cross reference of titles from DDS-30 to the files located in the "chapters" subdirectory of this CD-ROM. Appendix C is the directory tree structure

used in this CD-ROM. Appendix D is a list in outline form of all reports and their authors included in DDS-30. Appendix E is an explanation of the mapping strategy used in plays 5801, 5804, 5812, and 6101. Appendix F provides documentation for the exploration cell maps.

Located in the root directory is a file named dds30.err which is a compilation of errata for U.S. Geological Survey Digital Data Series DDS-30 (Gautier and others, 1995).

VIEWER PROGRAMS

Five viewer programs are included in this CD-ROM and run only in MS-DOS. They are:

(1) Map display program quikvu20.exe, in the "programs" subdirectory, was designed to be copied from the CD-ROM to the user's hard drive to speed up the map viewing process. The program quikvu20.exe will then search for the appropriate .cls and .lin files in the same directory where it is located. Users can copy to their local hard drive (into a single subdirectory) quikvu20.exe and the selection of regional .lin files, province .cls and .lin files, and play .cls and .lin files needed for their area of interest (users should be aware that these files will be write-protected). The regional .lin and province .lin files are needed if the option of regional background and province outline are selected when running quikvu20.exe or quikview.exe.

(2) Map display program quikview.exe (located in the root directory) is designed to run from the CD-ROM rather than from the user's hard drive. It uses the established directory structure of the CD-ROM to search for the appropriate .cls and .lin map files. As an alternative, the user could run quikview.exe from the hard drive, but the subdirectory names and file locations relative to the location of quikview.exe would have to be similar to those on the CD-ROM. Users can copy an entire region and its subdirectory structure to their hard drive and display play and province level maps that are contained in that particular region. Files copied from the CD-ROM will contain the read-only attribute, which will cause file delete errors in DOS. Users can turn off the read-only attribute with the DOS ATTRIB (option /S) program.

Running quikview.exe from the CD-ROM is much slower than running quikview.exe and quikvu20.exe from the hard drive due to the speed limitations of CD-ROM technology. In benchmark tests using play "4700" (the province-level map for the Western Gulf province -- the largest such map in the data set) on a 486/66 micro-computer, quikvu20.exe took approximately 5 minutes running from the hard drive while quikview.exe (executing from the CD-ROM drive) took almost 3 hours running from the same computer with a double speed CD-ROM reader. For small maps, however, quikview.exe does give adequate performance, drawing the map in a matter of minutes.

(3) Map display program `alaskavu.exe` (located in the root directory), is a program similar to `quikview.exe` for use with maps of Alaska. It runs from the CD-ROM rather than from the user's hard drive. As an alternative, the user could run `alaskavu.exe` from the hard drive, but the subdirectory names and file locations relative to the location of `alaskavu.exe` would have to be similar to those on the CD-ROM. Users can copy the entire "region1" subdirectory and its subdirectory structure to their hard drive and display play and province level maps that are contained in "region1".

(4) The program `cshow.exe` is a shareware image-display program (CompuShow) developed by Bob Berry of Canyon State Systems and Software. Located in the "programs" directory is `cshowa.exe`, a self-extracting archive of the program `cshow.exe`, supporting drivers, and documentation. Users must run the `cshowa.exe` program to install `cshow.exe` and supporting files to their hard drives. When running `cshowa.exe`, users will be asked where to install `cshow.exe`. The program will then self-extract `cshow.exe` and the supporting files to the location specified. After installation, `cshow.exe` can be used to view the JPEG images on this CD-ROM. The documentation describes the specific shareware guidelines concerning the use of `cshow.exe`.

(5) `\chapters\hydrates\hydву20.exe`, which runs only from the "hydrates" subdirectory, is a special program for viewing the gas hydrate maps. As an alternative, the user could run `hydву20.exe` from the hard drive, but the subdirectory names and file locations relative to the location of `hydву20.exe` would have to be similar to those on the CD-ROM. Users can copy the entire "hydrates" subdirectory to their hard drive and display gas hydrate maps that are contained in the "hydrates" subdirectory.

The programs `quikву20.exe`, `alaskavu.exe`, and `hydву20.exe` were developed for this report for quick viewing of the province and play maps stored in ASCII. Users can interrupt (return to the DOS prompt) `quikview.exe` and `quikву20.exe` by entering a SHIFT X keystroke sequence during program execution. All three programs (`quikву20.exe`, `alaskavu.exe`, and `hydву20.exe`) plot the 1/4-mile by 1/4-mile .cls province and play data, rather than the 1-mile by 1-mile .cls regional data. A viewer for the regional data is not provided, but the data are plotted in the national map that is provided in Adobe Illustrator format (`regprov.ai`), JPEG format (`regprov.jpg`), and HPGL2 graphics output format (`regprov.hp`).

Many of the MACROMEDIA illustrations used in DDS-30 have been converted to JPEG images for more rapid viewing by the user. JPEG images (.jpg extension) are included for the figures and tables of the executive summary of results and for other chapters, for the United States map showing the regions assessed (see `index.jpg`, located in the root directory), and for the stratigraphic charts (`prxxst.jpg`) for each province. JPEG images are not included for the index maps of the provinces, but an outline of each province is included (`filexx00.lin`). In addition to the JPEG image format, Adobe Illustrator versions

(.ai extension) for many of the chapter figures and stratigraphic charts (prxxst.ai) are also provided. The Adobe files were created with Adobe Illustrator version 5.5 for Macintosh.

Copyright restrictions limit the selection of viewers on DDS-35. Other viewers that support the JPEG format are available from many anonymous File Transfer Protocol (FTP) sites for MS-DOS, UNIX, Macintosh, and Windows operating systems; such viewers include "lview" (Windows) and "jpegview" (Macintosh). Anonymous FTP sites to investigate for viewers include: <ftp.ncsa.uiuc.edu> and <greenwood.cr.usgs.gov>. Users can FTP to these locations, and, with the user name "anonymous" and a password such as "guest" or their e-mail address, obtain viewers as well as a wide variety of publicly available shareware programs and utilities. JPEG images can be viewed, printed, and converted to other graphical formats through the use of some of the newer JPEG viewers available through anonymous FTP sites. Two web sites that may also be useful places to check for viewers are SimTel:

<http://www.acs.oakland.edu/oak/oak.html>

and Jumbo:

<http://www.jumbo.com>

OTHER PROGRAMS

There are two ARC/INFO Macro Language (AML) files located in the programs subdirectory:

(1) The program `prcls.aml`, designed by William Beeman, is used to convert ASCII cell files at province level into ARC/INFO coverages. It assumes that the ASCII cell data files have data for x, y location and production type only and have been downloaded from DDS-35 to the same directory where `prcls.aml` is located.

(2) The program `regcls.aml`, designed by William Beeman, is used to convert ASCII cell files at region level into ARC/INFO coverages. It assumes that the ASCII cell data files have data for x, y location and various data items (reference file `celldoc.txt` for a complete description of data items) and have been downloaded from DDS-35 to the same directory where `regcls.aml` is located.

OVERVIEW OF THE CD-ROM STRUCTURE

The directory structure for this CD-ROM is based upon the structure of the 1995 National Oil and Gas Assessment as portrayed in DDS-30. There are 8 regions for the assessment, consisting of 71 provinces. (Province 30 was merged with province 28 (North Central Montana); province 30 was dropped. Province 6, Klamath - Sierra Nevada, was not assessed. Province 15, San Diego - Oceanside, is not included; it will be assessed by the Minerals Management Service.) The directory structure consists of

12 main directories (chapters, fedoffsh, national, programs, region1, region2, region3, region4, region5, region6, region7, and region8). Each regional directory contains text, map data, and separate subdirectories for each province within that region (provxx where xx is the province number assigned for the assessment). The province subdirectory contains the supporting map data, geologic descriptions, and stratigraphic columns for all of the plays assessed within the specific province. The directory called "fedoffsh" contains 1/4-mile cell data (fedoffsh.cls) for the Federal offshore waters adjacent to the lower 48 States and 1/4-mile cell data (akfedoff.cls) for the Federal offshore waters adjacent to Alaska. The directory called "national" contains State and county line data (State and county outlines) for the lower 48 States. In addition, a 40-inch by 28-inch region and province index map for the lower 48 States (Dolton and others, 1996) is provided in Adobe Illustrator format (regprov.ai), JPEG format (regprov.jpg), and HPGL2 graphics output format (regprov.hp). The directory called "chapters" contains other assessment information that is not specific to a particular region. This information includes printable files such as the executive summary of results of the 1995 National oil and gas assessment; specific reports relating to topics such as methodology, GIS, and coalbed methane; and JPEG images of figures, maps, plates, and tables contained in the various chapters.

The root directory of DDS-35 also includes nine files. Both formatted text (readme.ans) and rich-text format (readme.rtf) versions of this readme file are included. The plain text file dds30.err is a compilation of errata for U.S. Geological Survey Digital Data Series 30 (DDS-30, Gautier and others, 1995). Viewers alaskavu.exe and quikview.exe are included. The file permissn.jpg is a JPEG image of a letter from Bob Berry of Canyon State Systems and Software granting permission to distribute the CompuShow viewer (cshow.exe). Three text files are extracts from this readme file. File celldoc.txt is a copy of appendix F of this readme file, file authors.ans is a copy of the title block, and disclaim.ans is a copy of the disclaimer.

DATA OVERVIEW

Four main types of data are contained on this CD-ROM: map files containing cell data, map files containing line data, text files, and JPEG images.

MAP DATA

Regional-level cell data are provided in each of the regional directories (regx.cls). Cell data are also used to construct the exploration-history maps shown for each province in DDS-30 (filexx00.cls). Play-level files containing cell data have a .cls extension (filexxxx.cls and filxxxxx.cls). Several plays lack cell data and are represented by .cls files that contain only an "end" statement. The documentation for the cell data is in appendix F and in file celldoc.txt (located in the root directory).

Files containing line data have a .lin extension. Files ending with a co.lin or st.lin are included solely for the purpose of providing a base map for other data. Those files ending with a st.lin (including natst.lin) show State boundaries, including coastlines, and are from the 1:2,000,000 data set compiled by the USGS. The full, original data set can be obtained through 'anonymous FTP' at edcftp.cr.usgs.gov (internet protocol address 152.61.128.6). Those files ending with a co.lin (including natco.lin) represent county lines that are not coincident with State boundaries or coastlines, and come from a 1:100,000 data set extracted from U.S. Census TIGER/line files by Doug Nebert and Mark Negri, USGS. The full, original data set is available through 'anonymous FTP' at waisqvarsa.er.usgs.gov (internet protocol address 130.11.50.175). The original 1:100,000 data set was generalized by W. R. Beeman to eliminate features smaller than 1,000 meters. The data sets were then divided into smaller subsets of approximately the same areal extent as the assessment regions and provinces, which allows them to be utilized as background coverages without adversely impacting the drawing time using the map viewing program quikvu20.exe. The data sets are provided on this disk as convenient base maps for those who might choose to review the data using that map viewing program.

The state and county lines in the .lin files have been clipped by the region or province boundary so that only those lines within the appropriate region or province are included in the file. This clipping causes some edge effects where the region or province boundary coincides with State or county lines (as is the normal case). The state and county lines may have been partially removed, resulting in an interrupted line when drawn. Drawing the region or province outline on top of this will usually solve the problem; those who need a clean copy of the complete state or county lines can find all of them in the files natco.lin and natst.lin in the directory "national".

Files that begin "reg" but do not contain "co" or "st" represent outlines of assessment regions (regx.lin). The files in the province directories that end with "00.lin" represent outlines of assessment provinces. The outlines of assessment regions and provinces were compiled originally for Open-File Reports 92-696 and 93-331, both by Dolton and others (1992, 1993). Those outlines were later modified and converted to a digital format by W. R. Beeman, D. K. Vaughan, R. J. Viger, Z. C. Valin, and S. Tang (see acknowledgments in DDS-30).

Files that have a "file" or "fil" prefix and contain a four-digit number followed by a .lin extension, or a four-digit number followed by a single letter and the .lin extension, represent play outlines and are stored in the respective province directories. The first two digits always represent the province number; the next two digits represent the play number within that province. Plays 5801, 5804, 5812, and 6101 have several distinct and separate geographic parts and therefore multiple boundaries; an extra character is assigned to the file (5801a) to indicate which of the boundaries is represented. For a

complete explanation of these four plays, please see the play documentation for provinces 58 and 61 and appendix E. A name in the form filexx00.lin always represents the full province.

The play outlines and the factors controlling them were determined by the province geologists and described in the documentation for each play. Most play boundaries were scanned from base maps that were compiled at a scale of 1:500,000. Some maps were compiled at 1:100,000 on a computer display using the digital version of the 1:100,000 county lines and digital cell maps of oil and gas production. Scanned maps were edited and modified using ARC/INFO, a commercial geographic information system (GIS) software package that is a product of Environmental Systems Research Institute (ESRI). The stored line coverages were converted from an Albers Equal Area projection to an ASCII file format, in decimal degrees. Each ASCII file containing line information has an identifying number for each line segment, followed by a series of x, y pairs that identify the locations, in decimal degrees, of the line segment's vertices. There is an end statement signifying the end of each line segment, and a final end statement when all of the line segments have been listed.

The viewer quikvu20.exe can be used for a rough display of the map data. Rather than presenting the map in a particular projection, the viewer plots the data by longitude and latitude on linear X and Y axes. While for the lower 48 States the distortion of small areas may be acceptable, there is considerably more distortion for the high-latitude maps of Alaska. For that reason, an alternate set of files was created for all of the Alaskan play outlines. This set of files is in Albers Equal Area projection, with a central meridian of 150 degrees West, standard parallels of 55 degrees North and 65 degrees North, and a latitude of origin of 55 degrees North with no false easting or false northing. These Alaskan files have an "alb" prefix and are to be viewed using alaskavu.exe.

The digital compilers were W. R. Beeman, R. J. Viger, D. K. Vaughan, Z. C. Valin, D. L. Barnett, K. L. Aggen, R. R. Charpentier, and G. N. Seward (see acknowledgments in DDS-30).

TEXT DATA

Chapters

The "chapters" directory contains various documents supporting the assessment in both formatted text (.ans extension) and rich text (.rtf extension) format. Complex tables and charts were removed from text versions (.ans) due to formatting problems (files execsum.ans, coalgas.ans, probmeth.ans, gasres.ans, heavyoil.ans, hydrate.ans, and conttype.ans). However, rich-text versions of the reports contain the original charts and tables included in DDS-30. The figures and tables used in the executive summary (execsum.ans) and chapters (.ans files) were converted into JPEG images and are available in the "chapters" directory and "execsum" subdirectory (figx.jpg, figxx.jpg, tablex.jpg, and tablexy.jpg). In addition, figures and tables were saved as Adobe Illustrator files for many of the chapters (.ai extension). Some of the tables were separated by regions due to the size of the image (see executive summary table 2, which was separated into table2a, table2b, table2c and table2d). The self-extracting JPEG MS-DOS viewer enclosed with this CD-ROM (programs/cshowa.exe) can be used to view the figures and tables of the executive summary. Please refer to the documentation enclosed with the self-extracting archive (cshowa.exe).

Gas Hydrates Data

Text relating to gas hydrates (hydrate.rtf and hydrate.ans) is located in the subdirectory called "hydrates" (below the directory "chapters"). Many of the figures and plates referenced in the hydrates chapter are included as JPEG (hydrfgx.jpg and hydrplx.jpg) images and Adobe Illustrator files (hydrfgx.ai and hydrplx.ai). Map data are also included in the "hydrates" subdirectory as ASCII files that can be displayed using the MS-DOS program hydvu20.exe (/chapters/hydrates/hydvu20.exe). This program must be run from the "hydrates" subdirectory. The first four characters of each line-data file name (having the .lin extension) correspond to the area of study: alsk - Alaska offshore, akon - Alaska onshore, atmx - Atlantic Ocean and Gulf of Mexico, and paco - Pacific Ocean. For each offshore area, there are eight line-data files having a three-character code that succeeds the area code on the file name. These code definitions are as follows: bat - bathymetry, eez - bounding polygon for the area, gtg - geothermal gradient, hys - gas hydrate stability, ply - gas hydrate play, sbt - seabed temperature, sed - sediment thickness, and toc - total organic carbon. The Alaska onshore play includes only gas hydrate stability data and the gas hydrate play boundaries.

For gas hydrates, mylar base maps were compiled from maps ranging in scale from approximately 1:100,000 to 1:20,000,000. With the exception of the gas hydrate plays and the exclusive economic zone (EEZ) boundaries, the digital conversion of the data began with scanning the base maps. Editing and reprojecting all the maps into Albers Equal Area projection was done using ARC/INFO. The EEZ boundary used is the

combination of a 3-mi offshore limit calculated from State coastline data compiled by the U.S. Geological Survey at a scale of 1:100,000, and a scanned base map of the EEZ boundary (compiled at the U.S. Geological Survey at a scale of 1:20,000,000). Gas hydrate plays were defined by overlaying total organic carbon (TOC) maps (TOC values of 0.5 or greater) with the gas hydrate stability contour lines and the EEZ boundary.

These gas hydrate coverages were converted into ASCII files that consist of x,y coordinates for every vertex and a header for every line segment. The header represents isolines having measurement units appropriate to the data type: bathymetry in meters, sediment thickness in meters, seabed temperature in degrees Celsius, geothermal gradient in degrees Celsius per 100 m, and organic carbon in percent. Gas hydrate stability is given as the thickness of the hydrate stability field in meters. Header values (line identifiers) contained in files ending with toc.lin, sed.lin, and sbt.lin must be divided by ten to recreate the actual values. This division is necessary because ARC/INFO requires that the stored line identifier be an integer value. The header values for files ending with eez.lin and ply.lin are not for isolines but for line segments making up bounding polygons.

Regional Descriptions

Each regional directory contains the regional report in both formatted text (.ans extension) and rich text (.rtf extension) formats. The regional reports use the file-naming convention of regx.ans and regx.rtf, where x is the region number. The formatted text versions (.ans extension) of the reports can be read and printed from many operating systems. Due to various formatting issues, table and chart information was removed from the text versions (.ans extension) of the documents. The rich text versions (.rtf) of the reports can be imported into most word processing software packages, such as Word Perfect, Microsoft Word for Windows, and Microsoft Word for Macintosh.

Province Descriptions

Each province directory contains the text of the province report, including play descriptions, and is available in both text (.ans extension) and rich text format (.rtf extension). The province reports use the file-naming convention of provxx.ans and provxx.rtf, where xx is the province number. The formatted text versions (.ans extension) of the reports can be read and printed from many operating systems. Due to various formatting issues, table and chart information have been removed from certain formatted text versions of the documents (prov03.ans, prov27.ans, and prov31.ans). However, the rich text versions (.rtf) of all the reports contain all the original tables and charts included in DDS-30 and can be imported into most word processing software packages, such as Microsoft Word for Macintosh and Windows. Not included in either

format are the province index maps; statistical graphs; and non-text tabular data including estimates by play.

Stratigraphic Columns

Each province directory contains JPEG images (.jpg file extension) and Adobe Illustrator (Macintosh version 5.X) images (.ai file extension) of stratigraphic columns used for the assessment. The file-naming convention for the stratigraphic columns is prxxst.jpg and prxxst.ai, where xx is the province number associated with the specific stratigraphic column. Some of the larger stratigraphic columns were divided into multiple images indicated by an additional letter in the file name. The self-extracting MS-DOS JPEG viewer furnished with this CD-ROM (programs/cshowa.exe) can be used to view the JPEG images of the stratigraphic columns. The Adobe Illustrator versions (Macintosh version 5.X) of the stratigraphic columns (.ai) can be imported into both Macintosh and Microsoft Windows versions of Adobe Illustrator.

CREDITS

The following persons contributed to the production of DDS-35.

William R. Beeman (wbeeman@aol.com)	Compilation of map and cell data; map viewer programming; CD-ROM organization and GIS.
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Shirley A. Oscarson	Formatting of geologic text.
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Richard O. Butler

Editing and production of stratigraphic columns.

Eugene G. Ellis

Review of readme file.

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Appendix A

REGION AND PROVINCE NAMES

Region 1 -- Alaska

Province 1	Northern Alaska
Province 2	Central Alaska
Province 3	Southern Alaska

Region 2 -- Pacific Coast

Province 4	Western Oregon - Washington
Province 5	Eastern Oregon - Washington
Province 6	Klamath - Sierra Nevada
Province 7	Northern Coastal
Province 8	Sonoma - Livermore Basin
Province 9	Sacramento Basin
Province 10	San Joaquin Basin
Province 11	Central Coastal
Province 12	Santa Maria Basin
Province 13	Ventura Basin
Province 14	Los Angeles Basin
Province 15	San Diego - Oceanside
Province 16	Salton Trough

Region 3 -- Colorado Plateau and Basin and Range

Province 17	Idaho - Snake River Downwarp
Province 18	Western Great Basin
Province 19	Eastern Great Basin
Province 20	Uinta - Piceance Basin
Province 21	Paradox Basin
Province 22	San Juan Basin
Province 23	Albuquerque - Santa Fe Rift
Province 24	Northern Arizona
Province 25	Southern Arizona - Southwestern New Mexico
Province 26	South-Central New Mexico

Region 4 -- Rocky Mountains and Northern Great Plains

Province 27	Montana Thrust Belt
Province 28	North-Central Montana
Province 29	Southwest Montana
Province 31	Williston Basin
Province 32	Sioux Arch
Province 33	Powder River Basin
Province 34	Big Horn Basin

Province 35	Wind River Basin
Province 36	Wyoming Thrust Belt
Province 37	Southwestern Wyoming
Province 38	Park Basins
Province 39	Denver Basin
Province 40	Las Animas Arch
Province 41	Raton Basin - Sierra Grande Uplift

Region 5 -- West Texas and Eastern New Mexico

Province 42	Pedernal Uplift
Province 43	Palo Duro Basin
Province 44	Permian Basin
Province 45	Bend Arch - Fort Worth Basin
Province 46	Marathon Thrust Belt

Region 6 -- Gulf Coast

Province 47	Western Gulf
Province 48	East Texas Basin
Province 49	Louisiana-Mississippi Salt Basins
Province 50	Florida Peninsula

Region 7 -- Midcontinent

Province 51	Superior
Province 52	Iowa Shelf
Province 53	Cambridge Arch - Central Kansas Uplift
Province 54	Salina Basin
Province 55	Nemaha Uplift
Province 56	Forest City Basin
Province 57	Ozark Uplift
Province 58	Anadarko Basin
Province 59	Sedgwick Basin
Province 60	Cherokee Platform
Province 61	Southern Oklahoma
Province 62	Arkoma Basin

Region 8 -- Eastern

Province 63	Michigan Basin
Province 64	Illinois Basin
Province 65	Black Warrior Basin
Province 66	Cincinnati Arch
Province 67	Appalachian Basin
Province 68	Blue Ridge Thrust Belt
Province 69	Piedmont

Province 70	Atlantic Coastal Plain
Province 71	Adirondack Uplift
Province 72	New England

Appendix B CHAPTER FILE NAMES

The following is a list of filenames (in the "chapters" directory) and the corresponding titles for chapters in DDS-30 in the original order. Each file is available in two forms: formatted text (.ans extension) and rich text format (.rtf extension). JPEG (.jpg extension) and Adobe Illustrator (.ai extension) versions of figures and tables have filenames that begin with the same characters as the text filenames. Because of the large number of files associated with the executive summary and the hydrates chapters, these two groups of files have been placed in subdirectories "execsum" and "hydrates", respectively.

Filename	Title/Subject
execsum	Executive summary of results, "1995 National assessment of United States oil and gas resources" by U.S. Geological Survey National Oil and Gas Resource Assessment Team (executive summary files are located in the "execsum" subdirectory below the "chapters" directory)
intro	"Introduction, purpose and scope" by D.L. Gautier
dn30	"CD-ROM design notes" by K.I.Takahashi
method	"Methodology for assessment of undiscovered conventional accumulations" by D.L. Gautier and G.L. Dolton
hydrcarb	"Method for assessing continuous-type (unconventional) hydrocarbon accumulations" by J.W. Schmoker
coalgas	"Methodology for assessment of technically recoverable resources of coalbed gas" by D.D. Rice, G.B.C. Young, and G.W. Paul
probmeth	"Probabilistic methodology and computer programs for assessment of unconventional oil and gas resources" by R.A. Crovelli and R.H. Balay
gasres	"Deep natural gas reservoirs and conventional plays in the United States" by T.S. Dyman, M.S. Wilson, and W.R. Beeman
heavyoil	"Heavy-oil resources of the United States" by Mark Pawlewicz

hydrate	"Gas hydrate resources of the United States" by T.S. Collett (gas hydrate files are located in the "hydrate" subdirectory below the "chapters" directory)
gisdoc	"Development and use of a geographic information system (GIS) for resource appraisal" by W.R. Beeman
annbib	"Annotated bibliography of methodology for assessment of undiscovered oil and gas resources" by R.R. Charpentier, G.L. Dolton, and G.F. Ulmishek
playintr	"Introduction to play narratives" by K.L. Varnes
conttype	"Introduction to narratives for continuous-type accumulations" by J.W. Schmoker
cbm	"Geologic framework and description of coalbed gas plays" by D.D. Rice

Appendix C

DIRECTORY TREE STRUCTURE

The following is the directory tree structure of this CD-ROM (DDS-35). Listed are the directory names and associated files within each directory (directory and subdirectory names are in bold typeface and do not have file name extensions, such as .exe, .rtf or .ans).

Root directory:

alaskavu.exe

authors.ans

celldoc.txt

chapters

annbib.ans

annbib.rtf

cbm.ans

cbm.rtf

cbm1.ai

cbm1.jpg

cbm2.ai

cbm2.jpg

cbm3.ai

cbm3.jpg

coalgas.ans

coalgas.rtf

coalgas1.ai

coalgas1.jpg

coalgas2.ai

coalgas2.jpg

coalgas3.ai

coalgas3.jpg

coalgas4.ai

coalgas4.jpg

coalgas5.ai

coalgas5.jpg

coalgas6.ai

coalgas6.jpg

conttype.ans

conttype.rtf

conttyp1.ai

conttyp1.jpg

conttyp2.ai
conttyp2.jpg
conttyp3.ai
conttyp3.jpg
conttyp4.ai
conttyp4.jpg
dn30.ans
dn30.rtf
execsum
 execsum.ans
 execsum.rtf
 fig1.jpg
 fig2.jpg
 fig3.jpg
 fig4.jpg
 fig5.jpg
 fig6.jpg
 fig7.jpg
 fig8.jpg
 fig9.jpg
 fig10.jpg
 fig11.jpg
 fig12.jpg
 fig13.jpg
 table1.jpg
 table2a.jpg
 table2b.jpg
 table2c.jpg
 table2d.jpg
 table3.jpg
 table4a.jpg
 table4b.jpg
 table5a.jpg
 table5b.jpg
gasres.ans
gasres.rtf
gasres1.ai
gasres1.jpg
gasres2.ai
gasres2.jpg
gisdoc.ans
gisdoc.rtf
heavyoil.ans

heavyoil.rtf

hydrates

akon_hys.lin
akon_ply.lin
alsk_bat.lin
alsk_eez.lin
alsk_gtg.lin
alsk_hys.lin
alsk_ply.lin
alsk_sbt.lin
alsk_sed.lin
alsk_toc.lin
atmx_bat.lin
atmx_eez.lin
atmx_gtg.lin
atmx_hys.lin
atmx_ply.lin
atmx_sbt.lin
atmx_sed.lin
atmx_toc.lin
hydrate.ans
hydrate.rtf
hydrfg1.ai
hydrfg1.jpg
hydrfg2.ai
hydrfg2.jpg
hydrfg3a.ai
hydrfg3a.jpg
hydrfg3b.ai
hydrfg3b.jpg
hydrfg3c.ai
hydrfg3c.jpg
hydrfg5.ai
hydrfg5.jpg
hydrfg17.ai
hydrfg17.jpg
hydrpl1.ai
hydrpl1.jpg
hydrpl2.ai
hydrpl2.jpg
hydrpl3.ai
hydrpl3.jpg
hydrpl4.ai

hydrpl4.jpg
hydrpl5.ai
hydrpl5.jpg
hydrpl6.ai
hydrpl6.jpg
hydrpl7.ai
hydrpl7.jpg
hydrpl8.ai
hydrpl8.jpg
hydrpl9.ai
hydrpl9.jpg
hydrpl10.ai
hydrpl10.jpg
hydrpl11.ai
hydrpl11.jpg
hydrpl12.ai
hydrpl12.jpg
hydrpl13.ai
hydrpl13.jpg
hydrpl14.ai
hydrpl14.jpg
hydrpl15.ai
hydrpl15.jpg
hydrpl16.ai
hydrpl16.jpg
hydrpl17.ai
hydrpl17.jpg
hydrpl18.ai
hydrpl18.jpg
hydrpl19.ai
hydrpl19.jpg
hydrpl20.ai
hydrpl20.jpg
hydrpl21.ai
hydrpl21.jpg
hydrpl22.ai
hydrpl22.jpg
hydrpl23.ai
hydrpl23.jpg
hydvu20.exe
paco_bat.lin
paco_eez.lin
paco_gtg.lin

paco_hys.lin
paco_ply.lin
paco_sbt.lin
paco_sed.lin
paco_toc.lin
hydrcarb.ans
hydrcarb.rtf
hydrcar1.ai
hydrcar1.jpg
hydrcar2.ai
hydrcar2.jpg
hydrcar3.ai
hydrcar3.jpg
hydrcar4.ai
hydrcar4.jpg
hydrcar6.ai
hydrcar6.jpg
hydrcar7.ai
hydrcar7.jpg
intro.ans
intro.rtf
method.ans
method.rtf
playintr.ans
playintr.rtf
probmeth.ans
probmeth.rtf
prob1.ai
prob1.jpg
prob2.ai
prob2.jpg
prob3.ai
prob3.jpg
dds30.err
disclaim.ans
fedoffsh
akfedoff.cls
fedoffsh.cls
indexmap.jpg
national
natco.lin
natst.lin
regprov.ai

regprov.hp
regprov.jpg
permissn.jpg
programs
clarke.dat
cshowa.exe
prcls.aml
quikvu20.exe
regcls.aml
weller3.for
quikview.exe
readme.ans
readme.rtf
region1
alb1st.lin
prov01
alb0100.cls
alb0100.lin
alb0101.cls
alb0101.lin
alb0102.cls
alb0102.lin
alb0103.cls
alb0103.lin
alb0104.cls
alb0104.lin
alb0105.cls
alb0105.lin
alb0106.cls
alb0106.lin
alb0107.lin
alb0107.cls
alb0108.cls
alb0108.lin
alb0109.cls
alb0109.lin
alb0110.cls
alb0110.lin
alb0111.cls
alb0111.lin
alb01st.lin
file0100.cls
file0100.lin

file0101.cls
file0101.lin
file0102.cls
file0102.lin
file0103.cls
file0103.lin
file0104.cls
file0104.lin
file0105.cls
file0105.lin
file0106.cls
file0106.lin
file0107.cls
file0107.lin
file0108.cls
file0108.lin
file0109.cls
file0109.lin
file0110.cls
file0110.lin
file0111.cls
file0111.lin
pr01co.lin
pr01st.lin
pr1st.ai
pr1st.jpg
prov01.ans
prov01.rtf

prov02

alb0200.cls
alb0200.lin
alb0201.cls
alb0201.lin
alb0202.cls
alb0202.lin
alb0203.cls
alb0203.lin
alb0204.cls
alb0204.lin
alb0205.cls
alb0205.lin
alb02st.lin
file0200.cls

file0200.lin
file0201.cls
file0201.lin
file0202.cls
file0202.lin
file0203.cls
file0203.lin
file0204.cls
file0204.lin
file0205.cls
file0205.lin
pr02co.lin
pr02st.lin
pr2st.ai
pr2st.jpg
prov02.ans
prov02.rtf

prov03

alb0300.cls
alb0300.lin
alb0301.cls
alb0301.lin
alb0302.cls
alb0302.lin
alb0303.cls
alb0303.lin
alb0304.cls
alb0304.lin
alb0305.cls
alb0305.lin
alb0306.cls
alb0306.lin
alb0307.cls
alb0307.lin
alb0308.cls
alb0308.lin
alb0309.cls
alb0309.lin
alb03st.lin
file0300.cls
file0300.lin
file0301.cls
file0301.lin

file0302.cls
file0302.lin
file0303.cls
file0303.lin
file0304.cls
file0304.lin
file0305.cls
file0305.lin
file0306.cls
file0306.lin
file0307.cls
file0307.lin
file0308.cls
file0308.lin
file0309.cls
file0309.lin
pr03co.lin
pr03st.lin
pr3ast.ai
pr3ast.jpg
pr3bst.ai
pr3bst.jpg
prov03.ans
prov03.rtf

reg1.ans
reg1.cls
reg1.lin
reg1.rtf
reg1co.lin
reg1st.lin

region2

prov04

file0400.cls
file0400.lin
file0401.cls
file0401.lin
file0402.cls
file0402.lin
file0403.cls ** Play 0403 does not contain cell data as
indicated in DDS-30.
file0403.lin
file0404.cls
file0404.lin

file0405.cls
file0405.lin
file0406.cls
file0406.lin
file0407.cls
file0407.lin
file0408.cls
file0408.lin
file0410.cls
file0410.lin

** there are no play boundaries or cell data for play 0412;
 refer to province map, file0400.lin and file0400.cls

file0450.cls
file0450.lin
file0451.cls
file0451.lin
file0452.cls
file0452.lin
pr04co.lin
pr04st.lin
pr4st.ai
pr4st.jpg
prov04.ans
prov04.rtf

prov05

file0500.cls
file0500.lin
file0501.cls
file0501.lin
file0502.cls
file0502.lin
file0503.cls
file0503.lin
pr05co.lin
pr05st.lin
pr5st.ai
pr5st.jpg
prov05.ans
prov05.rtf

prov06

file0600.cls
file0600.lin
pr06co.lin

pr06st.lin
prov06.rtf
prov06.ans

prov07

file0700.cls
file0700.lin
file0701.cls
file0701.lin
file0702.cls
file0702.lin
file0703.cls
file0703.lin
pr07co.lin
pr07st.lin
pr7st.ai
pr7st.jpg
prov07.ans
prov07.rtf

prov08

file0800.cls
file0800.lin
file0801.cls
file0801.lin
pr08co.lin
pr08st.lin
pr8st.ai
pr8st.jpg
prov08.ans
prov08.rtf

prov09

file0900.cls
file0900.lin
file0901.cls
file0901.lin
file0902.cls
file0902.lin
file0903.cls
file0903.lin
pr09co.lin
pr09st.lin
pr9st.ai
pr9st.jpg
prov09.ans

prov09.rtf
prov10
file1000.cls
file1000.lin
file1001.cls
file1001.lin
file1002.cls
file1002.lin
file1003.cls
file1003.lin
file1004.cls
file1004.lin
file1005.cls
file1005.lin
file1006.cls
file1006.lin
file1007.cls
file1007.lin
file1008.cls
file1008.lin
file1009.cls
file1009.lin
file1010.cls
file1010.lin
file1011.cls
file1011.lin
pr10co.lin
pr10st.ai
pr10st.jpg
pr10st.lin
prov10.ans
prov10.rtf

prov11
file1100.cls
file1100.lin
file1101.cls
file1101.lin
file1102.cls
file1102.lin
file1103.cls
file1103.lin
file1104.cls
file1104.lin

file1105.cls
file1105.lin
file1106.cls
file1106.lin
file1107.cls
file1107.lin
file1109.cls
file1109.lin
pr11co.lin
pr11st.ai
pr11st.jpg
pr11st.lin
prov11.ans
prov11.rtf

prov12

file1200.cls
file1200.lin
file1201.cls
file1201.lin
file1202.cls
file1202.lin
file1204.cls
file1204.lin
file1211.cls
file1211.lin
pr12co.lin
pr12st.ai
pr12st.jpg
pr12st.lin
prov12.ans
prov12.rtf

prov13

file1300.cls
file1300.lin
file1301.cls
file1301.lin
file1302.cls
file1302.lin
file1303.cls
file1303.lin
file1304.cls
file1304.lin
file1311.cls

file1311.lin
file1312.cls
file1312.lin
pr13co.lin
pr13st.ai
pr13st.jpg
pr13st.lin
prov13.ans
prov13.rtf

prov14

file1400.cls
file1400.lin
file1401.cls
file1401.lin
file1402.cls
file1402.lin
file1403.cls
file1403.lin
file1404.cls
file1404.lin
file1405.cls
file1405.lin
file1406.cls
file1406.lin
file1407.cls
file1407.lin
file1408.cls
file1408.lin
pr14co.lin
pr14st.ai
pr14st.jpg
pr14st.lin
prov14.ans
prov14.rtf

prov15

file1500.cls
file1500.lin
pr15co.lin
pr15st.lin
prov15.ans
prov15.rtf

prov16

file1600.cls

- file1600.lin
- pr16co.lin
- pr16st.ai
- pr16st.jpg
- pr16st.lin
- prov16.ans
- prov16.rtf
- reg2.ans
- reg2.cls
- reg2.lin
- reg2.rtf
- reg2co.lin
- reg2st.lin
- region3**
 - prov17**
 - file1700.cls
 - file1700.lin
 - file1701.cls
 - file1701.lin
 - file1702.cls
 - file1702.lin
 - file1703.cls
 - file1703.lin
 - file1704.cls
 - file1704.lin
 - pr17co.lin
 - pr17st.ai
 - pr17st.jpg
 - pr17st.lin
 - prov17.ans
 - prov17.rtf
 - prov18**
 - file1800.cls
 - file1800.lin
 - file1801.cls
 - file1801.lin
 - file1802.cls
 - file1802.lin
 - file1803.cls
 - file1803.lin
 - file1804.cls
 - file1804.lin
 - file1805.cls

file1805.lin
pr18ast.ai
pr18ast.jpg
pr18bst.ai
pr18bst.jpg
pr18co.lin
pr18st.lin
prov18.ans
prov18.rtf

prov19

file1900.cls
file1900.lin
file1901.cls
file1901.lin
file1902.cls
file1902.lin
file1903.cls
file1903.lin
file1905.cls
file1905.lin
file1906.cls
file1906.lin
file1907.cls
file1907.lin
pr19co.lin
pr19st.ai
pr19st.jpg
pr19st.lin
prov19.ans
prov19.rtf

prov20

file2000.cls
file2000.lin
file2001.cls
file2001.lin
file2002.cls
file2002.lin
file2003.cls
file2003.lin
file2004.cls
file2004.lin
file2005.cls
file2005.lin

file2007.cls
file2007.lin
file2009.cls
file2009.lin
file2010.cls
file2010.lin
file2014.cls
file2014.lin
file2015.cls
file2015.lin
file2016.cls
file2016.lin
file2018.cls
file2018.lin
file2020.cls
file2020.lin
file2050.cls
file2050.lin
file2051.cls
file2051.lin
file2052.cls
file2052.lin
file2053.cls
file2053.lin
file2054.cls
file2054.lin
file2055.cls
file2055.lin
file2056.cls
file2056.lin
file2057.cls
file2057.lin
pr20co.lin
pr20st.ai
pr20st.jpg
pr20st.lin
prov20.ans
prov20.rtf

prov21

file2100.cls
file2100.lin
file2101.cls
file2101.lin

file2102.cls
file2102.lin
file2103.cls
file2103.lin
file2104.cls
file2104.lin
file2105.cls
file2105.lin
file2106.cls
file2106.lin
file2107.cls
file2107.lin
pr21co.lin
pr21st.ai
pr21st.jpg
pr21st.lin
prov21.ans
prov21.rtf

prov22

file2200.cls
file2200.lin
**
**
file2204.cls
file2204.lin
file2205.cls
file2205.lin
file2206.cls
file2206.lin
file2207.cls
file2207.lin
file2208.cls
file2208.lin
file2209.cls
file2209.lin
file2210.cls
file2210.lin
file2211.cls
file2211.lin
file2212.cls
file2212.lin
file2250.cls
file2250.lin

play 2201 was assessed with play 2102 in province 21
play 2203 was assessed with play 2104 in province 21

file2252.cls
file2252.lin
file2253.cls
file2253.lin
pr22co.lin
pr22st.ai
pr22st.jpg
pr22st.lin
prov22.ans
prov22.rtf

prov23

file2300.cls
file2300.lin
file2301.cls
file2301.lin
file2302.cls
file2302.lin
file2303.cls
file2303.lin
file2304.cls
file2304.lin
file2305.cls
file2305.lin
pr23co.lin
pr23st.ai
pr23st.jpg
pr23st.lin
prov23.ans
prov23.rtf

prov24

file2400.cls
file2400.lin
file2401.cls
file2401.lin
file2402.cls
file2402.lin
file2403.cls
file2403.lin
file2404.cls
file2404.lin
pr24co.lin
pr24st.ai
pr24st.jpg

pr24st.lin
prov24.ans
prov24.rtf

prov25

file2500.cls
file2500.lin
file2501.cls
file2501.lin
file2502.cls
file2502.lin
file2503.cls
file2503.lin
file2504.cls
file2504.lin
pr25co.lin
pr25st.ai
pr25st.jpg
pr25st.lin
prov25.ans
prov25.rtf

prov26

file2600.cls
file2600.lin
file2602.cls
file2602.lin
file2603.cls
file2603.lin
pr26co.lin
pr26st.ai
pr26st.jpg
pr26st.lin
prov26.ans
prov26.rtf

reg3.ans
reg3.cls
reg3.lin
reg3.rtf
reg3co.lin
reg3st.lin

region4

prov27

file2700.cls
file2700.lin

file2701.cls
file2701.lin
file2703.cls
file2703.lin
file2704.cls
file2704.lin
file2705.cls
file2705.lin
file2706.cls
file2706.lin
file2707.cls
file2707.lin
pr27co.lin
pr27st.ai
pr27st.jpg
pr27st.lin
prov27.ans
prov27.rtf

prov28

file2800.cls
file2800.lin
file2801.cls
file2801.lin
file2802.cls
file2802.lin
file2803.cls
file2803.lin
file2804.cls
file2804.lin
file2805.cls
file2805.lin
file2806.cls
file2806.lin
file2807.cls
file2807.lin
file2808.cls
file2808.lin
file2809.cls
file2809.lin
file2810.cls
file2810.lin
file2811.cls
file2811.lin

file2812.cls
file2812.lin
pr28co.lin
pr28st.ai
pr28st.jpg
pr28st.lin
prov28.ans
prov28.rtf

prov29

file2900.cls
file2900.lin
file2901.cls
file2901.lin
file2903.cls
file2903.lin
file2904.cls
file2904.lin
file2905.cls
file2905.lin
file2906.cls
file2906.lin
file2907.cls
file2907.lin
file2908.cls
file2908.lin
file2910.cls
file2910.lin
pr29co.lin
pr29st.ai
pr29st.jpg
pr29st.lin
prov29.ans
prov29.rtf

prov31

file3100.cls
file3100.lin
file3101.cls
file3101.lin
file3102.cls
file3102.lin
file3103.cls
file3103.lin
file3105.cls

file3105.lin
file3106.cls
file3106.lin
file3107.cls
file3107.lin
file3110.cls
file3110.lin
file3111.cls
file3111.lin
file3112.cls
file3112.lin
file3113.cls
file3113.lin
pr31co.lin
pr31st.ai
pr31st.jpg
pr31st.lin
prov31.ans
prov31.rtf

prov32

file3200.cls
file3200.lin
file3202.cls
file3202.lin
pr32co.lin
pr32st.ai
pr32st.jpg
pr32st.lin
prov32.ans
prov32.rtf

prov33

file3300.cls
file3300.lin
file3301.cls
file3301.lin
file3302.cls
file3302.lin
file3303.cls
file3303.lin
file3304.cls
file3304.lin
file3305.cls
file3305.lin

file3306.cls
file3306.lin
file3307.cls
file3307.lin
file3308.cls
file3308.lin
file3309.cls
file3309.lin
file3310.cls
file3310.lin
file3311.cls
file3311.lin
file3312.cls
file3312.lin
file3313.cls
file3313.lin
file3315.cls
file3315.lin
file3350.cls
file3350.lin
file3351.cls
file3351.lin
pr33co.lin
pr33st.ai
pr33st.jpg
pr33st.lin
prov33.ans
prov33.rtf

prov34

file3400.cls
file3400.lin
file3401.cls
file3401.lin
file3402.cls
file3402.lin
file3403.cls
file3403.lin
file3404.cls
file3404.lin
file3405.cls
file3405.lin
file3406.cls
file3406.lin

file3407.cls
file3407.lin
file3408.cls
file3408.lin
file3410.cls
file3410.lin
file3411.cls
file3411.lin
file3412.cls
file3412.lin
file3413.cls
file3413.lin
file3414.cls
file3414.lin
file3416.cls
file3416.lin
file3417.cls
file3417.lin
pr34co.lin
pr34st.ai
pr34st.jpg
pr34st.lin
prov34.ans
prov34.rtf

prov35

file3500.cls
file3500.lin
file3501.cls
file3501.lin
file3502.cls
file3502.lin
file3503.cls
file3503.lin
file3504.cls
file3504.lin
file3505.cls
file3505.lin
file3506.cls
file3506.lin
file3509.cls
file3509.lin
file3510.cls
file3510.lin

file3511.cls
file3511.lin
file3512.cls
file3512.lin
file3513.cls
file3513.lin
file3515.cls
file3515.lin
file3518.cls
file3518.lin
file3550.cls
file3550.lin
pr35co.lin
pr35st.ai
pr35st.jpg
pr35st.lin
prov35.ans
prov35.rtf

prov36

file3600.cls
file3600.lin
file3601.cls
file3601.lin
file3602.cls
file3602.lin
file3603.cls
file3603.lin
file3604.cls
file3604.lin
file3606.cls
file3606.lin
file3607.cls
file3607.lin
pr36co.lin
pr36st.ai
pr36st.jpg
pr36st.lin
prov36.ans
prov36.rtf

prov37

file3700.cls
file3700.lin
file3701.cls

file3701.lin
file3702.cls
file3702.lin
file3703.cls
file3703.lin
file3704.cls
file3704.lin
file3705.cls
file3705.lin
file3706.cls
file3706.lin
file3707.cls
file3707.lin
file3708.cls
file3708.lin

** no play boundary was determined for play 3709, refer to
the province map, file3700.cls and file3700.lin

file3740.cls
file3740.lin
file3741.cls
file3741.lin
file3742.cls
file3742.lin
file3743.cls
file3743.lin
file3744.cls
file3744.lin
file3750.cls
file3750.lin
file3751.cls
file3751.lin
file3752.cls
file3752.lin
file3753.cls
file3753.lin
file3754.cls
file3754.lin
file3755.cls
file3755.lin
pr37co.lin
pr37st.ai
pr37st.jpg
pr37st.lin

prov37.ans
prov37.rtf
prov38
file3800.cls
file3800.lin
file3801.cls
file3801.lin
file3802.cls
file3802.lin
file3803.cls
file3803.lin
pr38co.lin
pr38st.ai
pr38st.jpg
pr38st.lin
prov38.ans
prov38.rtf
prov39
file3900.cls
file3900.lin
file3901.cls
file3901.lin
file3903.cls
file3903.lin
file3904.cls
file3904.lin
file3905.cls
file3905.lin
file3906.cls
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file3907.cls
file3907.lin
file3908.cls
file3908.lin
file3910.cls
file3910.lin
file3911.cls
file3911.lin
file3920.cls
file3920.lin
file3921.cls
file3921.lin
pr39co.lin

pr39st.ai
pr39st.jpg
pr39st.lin
prov39.ans
prov39.rtf

prov40

file4000.cls
file4000.lin
file4001.cls
file4001.lin
file4004.cls
file4004.lin
file4005.cls
file4005.lin
pr40co.lin
pr40st.ai
pr40st.jpg
pr40st.lin
prov40.ans
prov40.rtf

prov41

file4100.cls
file4100.lin
file4101.cls
file4101.lin
file4102.cls
file4102.lin
file4150.cls
file4150.lin
file4151.cls
file4151.lin
file4152.cls
file4152.lin
pr41co.lin
pr41st.ai
pr41st.jpg
pr41st.lin
prov41.ans
prov41.rtf

reg4.ans
reg4.cls
reg4.lin
reg4.rtf

reg4co.lin
reg4st.lin
region5
 prov42
 file4200.cls
 file4200.lin
 file4201.cls
 file4201.lin
 pr42co.lin
 pr42st.ai
 pr42st.jpg
 pr42st.lin
 prov42.ans
 prov42.rtf
 prov43
 file4300.cls
 file4300.lin
 file4301.cls
 file4301.lin
 pr43co.lin
 pr43st.ai
 pr43st.jpg
 pr43st.lin
 prov43.ans
 prov43.rtf
 prov44
 file4400.cls
 file4400.lin
 file4401.cls
 file4401.lin
 file4402.cls
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 file4403.cls
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file4408.lin
file4409.cls
file4409.lin
file4410.cls
file4410.lin
file4411.cls
file4411.lin
file4412.cls
file4412.lin
pr44co.lin
pr44st.ai
pr44st.jpg
pr44st.lin
prov44.ans
prov44.rtf

prov45

file4500.cls
file4500.lin
file4501.cls
file4501.lin
file4502.cls
file4502.lin
file4503.cls
file4503.lin
file4504.cls
file4504.lin
file4505.cls
file4505.lin
file4506.cls
file4506.lin
file4510.cls
file4510.lin
pr45co.lin
pr45st.ai
pr45st.jpg
pr45st.lin
prov45.ans
prov45.rtf

prov46

file4600.cls
file4600.lin
file4601.cls
file4601.lin

pr46co.lin
pr46st.lin
pr46st.ai
pr46st.jpg
prov46.ans
prov46.rtf
reg5.ans
reg5.cls
reg5.lin
reg5.rtf
reg5co.lin
reg5st.lin
region6
prov47

file4700.cls
file4700.lin
file4701.cls
file4701.lin
file4702.cls
file4702.lin
file4703.cls
file4703.lin
file4704.cls
file4704.lin
file4705.cls
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file4706.cls
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file4747.cls
file4747.lin
file4748.cls
file4748.lin
file4749.cls
file4749.lin
pr47co.lin
pr47st.ai
pr47st.jpg
pr47st.lin
prov47.ans
prov47.rtf

prov48

file4800.cls
file4800.lin
pr48co.lin
pr48st.ai
pr48st.jpg
pr48st.lin
prov48.ans
prov48.rtf

prov49

file4900.cls

file4900.lin
file4901.cls
file4901.lin
file4902.cls
file4902.lin
file4903.cls
file4903.lin
file4904.cls
file4904.lin
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file4906.cls
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file4943.lin
file4944.cls
file4944.lin
file4945.cls
file4945.lin
file4946.cls
file4946.lin
file4947.cls
file4947.lin
pr49co.lin
pr49st.ai
pr49st.jpg
pr49st.lin
prov49.ans
prov49.rtf

prov50

file5000.cls
file5000.lin
file5001.cls
file5001.lin
file5002.cls
file5002.lin
file5003.cls
file5003.lin
file5004.cls
file5004.lin
file5005.cls
file5005.lin
file5006.cls
file5006.lin
pr50co.lin
pr50st.ai
pr50st.jpg
pr50st.lin
prov50.ans
prov50.rtf

reg6.ans
reg6.cls
reg6.lin
reg6.rtf
reg6co.lin
reg6st.lin

region7

prov51

file5100.cls
file5100.lin
file5101.cls
file5101.lin
pr51co.lin
pr51st.ai
pr51st.jpg
pr51st.lin
prov51.ans
prov51.rtf

prov52

file5200.cls
file5200.lin
file5201.cls
file5201.lin
pr52co.lin
pr52st.ai
pr52st.jpg
pr52st.lin
prov52.ans
prov52.rtf

prov53

file5300.cls
file5300.lin
file5303.cls
file5303.lin
file5304.cls
file5304.lin
file5305.cls
file5305.lin
file5308.cls
file5308.lin
file5309.cls
file5309.lin
pr53co.lin
pr53st.ai
pr53st.jpg
pr53st.lin
prov53.ans
prov53.rtf

prov54

file5400.cls

file5400.lin
pr54co.lin
pr54st.ai
pr54st.jpg
pr54st.lin
prov54.ans
prov54.rtf

prov55

file5500.cls
file5500.lin
file5501.cls
file5501.lin
file5503.cls
file5503.lin
file5504.cls
file5504.lin
file5505.cls
file5505.lin
file5507.cls
file5507.lin
pr55co.lin
pr55st.ai
pr55st.jpg
pr55st.lin
prov55.ans
prov55.rtf

prov56

file5600.cls
file5600.lin
file5601.cls
file5601.lin
file5602.cls
file5602.lin
file5603.cls
file5603.lin
file5650.cls
file5650.lin
pr56co.lin
pr56st.ai
pr56st.jpg
pr56st.lin
prov56.ans
prov56.rtf

prov57

file5700.cls
file5700.lin
file5701.cls
file5701.lin
pr57co.lin
pr57st.ai
pr57st.jpg
pr57st.lin
prov57.ans
prov57.rtf

prov58

file5800.cls
file5800.lin
fil5801a.cls
fil5801a.lin
fil5801b.cls
fil5801b.lin
fil5801c.cls
fil5801c.lin
fil5801d.cls
fil5801d.lin
file5802.cls
file5802.lin
file5803.cls
file5803.lin
fil5804a.cls
fil5804a.lin
fil5804b.cls
fil5804b.lin
fil5804c.cls
fil5804c.lin
fil5804d.cls
fil5804d.lin
fil5804e.cls
fil5804e.lin
fil5804f.cls
fil5804f.lin
fil5804g.cls
fil5804g.lin
fil5804h.cls
fil5804h.lin
fil5804i.cls

fil5804i.lin
fil5804j.cls
fil5804j.lin
fil5804k.cls
fil5804k.lin
fil5804l.cls
fil5804l.lin
fil5804m.cls
fil5804m.lin
fil5804n.cls
fil5804n.lin
fil5804o.cls
fil5804o.lin
file5805.cls
file5805.lin
file5807.cls
file5807.lin
file5809.cls
file5809.lin
file5810.cls
file5810.lin
file5811.cls
file5811.lin
file5812.cls
file5812.lin
fil5812a.cls
fil5812a.lin
fil5812b.cls
fil5812b.lin
fil5812c.cls
fil5812c.lin
fil5812d.cls
fil5812d.lin
fil5812e.cls
fil5812e.lin
fil5812f.cls
fil5812f.lin
fil5812g.cls
fil5812g.lin
fil5812h.cls
fil5812h.lin
fil5812i.cls
fil5812i.lin

file5813.cls
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file5815.cls
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file5816.cls
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file5822.cls
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file5823.cls
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file5824.cls
file5824.lin
file5825.cls
file5825.lin
file5827.cls
file5827.lin
file5828.cls
file5828.lin
pr58co.lin
pr58ast.ai
pr58ast.jpg
pr58bst.ai
pr58bst.jpg
pr58cst.ai
pr58cst.jpg
pr58dst.ai
pr58dst.jpg
pr58st.lin
prov58.ans
prov58.rtf

prov59

file5900.cls
file5900.lin
file5901.cls
file5901.lin
file5902.cls
file5902.lin
file5903.cls
file5903.lin
pr59co.lin
pr59st.ai
pr59st.jpg
pr59st.lin
prov59.ans
prov59.rtf

prov60

file6000.cls
file6000.lin
file6001.cls
file6001.lin
file6003.cls
file6003.lin
file6004.cls
file6004.lin
file6005.cls
file6005.lin
file6007.cls
file6007.lin
file6050.cls
file6050.lin
pr60co.lin
pr60st.ai
pr60st.jpg
pr60st.lin
prov60.ans
prov60.rtf

prov61

fil6101a.cls
fil6101a.lin
fil6101b.cls
fil6101b.lin
fil6101c.cls
fil6101c.lin
fil6101d.cls

fil6101d.lin
fil6101e.cls
fil6101e.lin
fil6101f.cls
fil6101f.lin
fil6101g.cls
fil6101g.lin
fil6101h.cls
fil6101h.lin
file6100.cls
file6100.lin
file6102.cls
file6102.lin
file6103.cls
file6103.lin
file6104.cls
file6104.lin
file6105.cls
file6105.lin
file6107.cls
file6107.lin
file6108.cls
file6108.lin
file6109.cls
file6109.lin
file6110.cls
file6110.lin
file6111.cls
file6111.lin
file6112.cls
file6112.lin
file6113.cls
file6113.lin
pr61co.lin
pr61ast.ai
pr61ast.jpg
pr61bst.ai
pr61bst.jpg
pr61cst.ai
pr61cst.jpg
pr61dst.ai
pr61dst.jpg
pr61st.lin

prov61.ans
prov61.rtf
prov62
file6200.cls
file6200.lin
file6201.cls
file6201.lin
file6202.cls
file6202.lin
file6203.cls
file6203.lin
file6204.cls
file6204.lin
file6205.cls
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file6206.cls
file6206.lin
file6207.cls
file6207.lin
file6208.cls
file6208.lin
file6209.cls
file6209.lin
file6250.cls
file6250.lin
file6251.cls
file6251.lin
pr62co.lin
pr62st.ai
pr62st.jpg
pr62st.lin
prov62.ans
prov62.rtf
reg7.ans
reg7.cls
reg7.lin
reg7.rtf
reg7co.lin
reg7st.lin
region8
prov63
file6300.cls
file6300.lin

file6301.cls
file6301.lin
file6303.cls
file6303.lin
file6304.cls
file6304.lin
file6306.cls
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file6307.cls
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file6319.cls
file6319.lin
file6320.cls
file6320.lin
pr63co.lin
pr63st.ai
pr63st.jpg
pr63st.lin
prov63.ans
prov63.rtf

prov64

file6400.cls
file6400.lin

file6401.cls
file6401.lin
file6402.cls
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file6403.cls
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file6409.cls
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file6410.cls
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file6411.cls
file6411.lin
file6412.cls
file6412.lin
file6450.cls
file6450.lin
pr64co.lin
pr64st.ai
pr64st.jpg
pr64st.lin
prov64.ans
prov64.rtf

prov65

file6500.cls
file6500.lin
file6501.cls
file6501.lin
file6502.cls
file6502.lin
file6503.cls
file6503.lin
file6505.cls
file6505.lin
file6550.cls
file6550.lin
file6551.cls
file6551.lin

file6552.cls
file6552.lin
file6553.cls
file6553.lin
pr65co.lin
pr65st.ai
pr65st.jpg
pr65st.lin
prov65.ans
prov65.rtf

prov66

file6600.cls
file6600.lin
file6601.cls
file6601.lin
file6602.cls
file6602.lin
file6603.cls
file6603.lin
file6604.cls
file6604.lin
file6605.cls
file6605.lin
pr66co.lin
pr66st.ai
pr66st.jpg
pr66st.lin
prov66.ans
prov66.rtf

prov67

file6700.cls
file6700.lin
file6701.cls
file6701.lin
file6702.cls
file6702.lin
file6703.cls
file6703.lin
file6704.cls
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file6706.cls
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file6708.cls

file6708.lin
file6714.cls
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file6741.cls
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file6750.cls
file6750.lin
file6751.cls
file6751.lin
file6752.cls
file6752.lin
file6753.cls
file6753.lin
pr67co.lin
pr67st.ai
pr67st.jpg
pr67st.lin
prov67.ans
prov67.rtf

prov68

file6800.cls
file6800.lin
file6801.cls
file6801.lin
file6802.cls
file6802.lin
pr68co.lin
pr68ast.ai
pr68ast.jpg
pr68bst.ai
pr68bst.jpg
pr68st.lin
prov68.ans
prov68.rtf

prov69

file6900.cls
file6900.lin
file6901.cls
file6901.lin
pr69co.lin
pr69st.ai
pr69st.jpg

pr69st.lin
prov69.ans
prov69.rtf

prov70

file7000.cls
file7000.lin
pr70co.lin
pr70st.ai
pr70st.jpg
pr70st.lin
prov70.ans
prov70.rtf

prov71

file7100.cls
file7100.lin
pr71co.lin
pr71st.ai
pr71st.jpg
pr71st.lin
prov71.ans
prov71.rtf

prov72

file7200.cls
file7200.lin
pr72co.lin
pr72ast.ai
pr72ast.jpg
pr72bst.ai
pr72bst.jpg
pr72st.lin
prov72.ans
prov72.rtf

reg8.ans
reg8.cls
reg8.lin
reg8.rtf
reg8co.lin
reg8st.lin

Appendix D

OUTLINE OF DDS-30

Executive summary of results, "1995 National assessment of United States oil and gas resources" by U.S. National Oil and Gas Resource Assessment Team

"Introduction, purpose and scope" by D.L. Gautier

"CD-ROM design notes for DDS-30" by K.I. Takahashi

METHODOLOGY

- A. Assessment of conventional oil and gas
 - 1. "Methodology for assessment of undiscovered conventional accumulations" by D.L. Gautier and G.L. Dolton
 - 2. "Deep natural gas reservoirs and conventional plays in the United States" by T.S. Dyman, M.S. Wilson, and W.R. Beeman
- B. Assessment of unconventional oil and gas
 - 1. "Probabilistic methodology and computer programs for assessment of unconventional oil and gas resources" by R.A. Crovelli and R.H. Balay
 - 2. "Method for assessing continuous-type (unconventional) hydrocarbon accumulations" by J.W. Schmoker
 - 3. "Methodology for assessment of technically recoverable resources of coalbed gas" by D.D. Rice, G.B.C. Young, and G.W. Paul
 - 4. "Gas hydrate resources of the United States" by T. S. Collett
 - 5. "Heavy-oil resources of the United States" by Mark Pawlewicz
- C. Other
 - 1. "Annotated bibliography of methodology for assessment of undiscovered oil and gas resources" by R.R. Charpentier, G.L. Dolton, and G.F. Ulmishek
 - 2. "Development and use of a geographic information system (GIS) for resource appraisal" by W.R. Beeman

DESCRIPTIONS OF PROVINCES AND PLAYS ASSESSED

The author of the province report is the author of all the province and play text unless otherwise noted. All unconventional plays are listed; frequently they are written by an author who is not the province geologist.

"Introduction to play narratives" by K. L. Varnes

"Region 1 Alaska" by K. J. Bird

"Northern Alaska Province (001)" by K. J. Bird

"Central Alaska Province (002)" by R. G. Stanley

"Kandik Basin" by D. G. Howell

"Southern Alaska Province (003)" by L. B. Magoon, C.M. Molenaar, T.R. Bruns, M.A. Fisher, and Z.C. Valin

- "Introduction" by L.B. Magoon
 - "Alaska Peninsula" by C. M. Molenaar
 - "Cook Inlet Basin" by L. B. Magoon
 - "Gulf of Alaska" by T. R. Bruns
 - "Copper River Basin" by L. B. Magoon and Z.C. Valin
 - "Southeast Alaska Area" by T. R. Bruns
 - "Kodiak Islands" by M.A. Fisher
- "Region 2 Pacific Coast" by K.J. Bird, L.B. Magoon, and M.E. Tennyson
- "Western Oregon-Washington Province (004)" by S.Y. Johnson and M.E. Tennyson
 - a. Continuous-type play:
 - 0412 "Willamette - Puget Sound Basin-Centered Gas play" by B.E. Law
 - b. Coal-bed gas plays
 - 0450 "Western Washington - Bellingham Basin play 0450" by S.Y. Johnson and D.D. Rice
 - 0451 "Western Washington - Western Cascade Mountains play 0451" by S.Y. Johnson and D.D. Rice
 - 0452 "Western Washington - Southern Puget Lowlands play 0452" by S.Y. Johnson and D.D. Rice
 - " Eastern Oregon-Washington Province (005)" by M.E. Tennyson
 - Continuous-type play:
 - 0503 "Columbia Basin - Basin-Centered Gas play 0503" by B. E. Law
 - "Klamath - Sierra Nevada Province (006) (Not assessed)"
 - "Northern Coastal Province (007)" by R.G. Stanley
 - "Sonoma-Livermore Basin Province (008)" by L. B. Magoon
 - "Sacramento Basin Province (009)" by L. B. Magoon and Z.C. Valin
 - "San Joaquin Basin Province (010)" by L.A. Beyer
 - "Central Coastal Province (011)" by R.G. Stanley, with a section on Cuyama Basin by M. E. Tennyson
 - "Santa Maria Basin Province (012)" by M.E. Tennyson
 - "Ventura Basin Province (013)" by M.A. Keller
 - "Los Angeles Basin Province (014)" by L. A. Beyer
 - Continuous-type play:
 - 1408 "Deep, Over-Pressured Fractured Rocks of the Central Syncline Play"
 - "San Diego - Oceanside Province (015)" To be assessed by MMS
 - "Salton Trough Province (016)" by C.E. Barker
- "Region 3- Colorado Plateau and Basin and Range" by J.A. Peterson and J.A. Grow
- "Idaho-Snake River Downwarp Province (017)" by J. A. Peterson
 - "Western Great Basin Province (018)" by C. E. Barker, T.D. Fouch, J.A. Grow, and J.A. Peterson
 - "Eastern Great Basin Province (019)" by J. A. Peterson and J. A. Grow

- "Uinta - Piceance Basin Province (020)" by C.W. Spencer
- a. Continuous-type play:
 - 2009 Cretaceous Self-Sourced Fractured Shales Oil
 - b. Tight-gas plays of the Piceance basin
 - 2007 Tight Gas Piceance Mesaverde Williams Fork play
 - 2010 Tight Gas Piceance Mesaverde Iles
 - c. "Tight gas plays of the Uinta Basin" by T.D. Fouch and J.W.Schmoker
 - 2015 Tight Gas Uinta Tertiary East
 - 2016 Tight Gas Uinta Tertiary West
 - 2018 Basin Flank Uinta Mesaverde
 - 2020 Deep Synclinal Uinta Mesaverde
 - d. "Coalbed gas plays of the Uinta Basin" by D.D. Rice, T.M. Finn, and W.B. Cashion
 - 2050 Uinta Basin - Book Cliffs
 - 2051 Uinta Basin - Sego
 - 2052 Uinta Basin - Emery
 - e. "Coalbed gas plays of the Piceance Basin" by R.C. Johnson, D.D. Rice, and T.M. Finn
 - 2053 Piceance Basin - White River Dome
 - 2054 Piceance Basin - Western Basin Margin
 - 2055 Piceance Basin - Grand Hogback
 - 2056 Piceance Basin - Divide Creek Anticline
- "Paradox Basin Province (021)" by A. C. Huffman, Jr.
- Continuous-type play:
- 2103 Fractured Interbed
- "San Juan Basin Province (022)" by A.C. Huffman, Jr.
- a. Continuous-type plays:
 - 2205 Dakota Central Basin Gas
 - 2208 Mancos Fractured Shale
 - 2209 Central Basin Mesaverde Gas
 - 2211 Pictured Cliffs Gas
 - b. "Coal-bed gas plays" by D. D. Rice and T. M. Finn
 - 2250 San Juan Basin - Overpressured
 - 2252 San Juan Basin - Underpressured Discharge
 - 2253 San Juan Basin - Underpressured
- "Albuquerque - Santa Fe Rift Province (023)" by C.M. Molenaar
- "Northern Arizona Province (024)" by W.C. Butler
- "Southern Arizona - Southwestern New Mexico Province (025)" by W.C. Butler
- "South-Central New Mexico Province (026)" by W. C. Butler

"Region 4-Rocky Mountains and Northern Great Plains" by C.W. Spencer

"Montana Thrust Belt Province (027)" by W. J. Perry, Jr.

- a. Continuous-type play by W. J. Perry, Jr.

- 2703 Cone Calcareous Member, Marias River Shale
- "North-Central Montana Province (028)" by T. S. Dyman
 - a. Continuous-type plays:
 - 2804 Bakken Shale Fracture Systems
 - "Northern Great Plains Biogenic Gas plays" by D.D. Rice and C. W. Spencer
 - 2810 Northern Great Plains Biogenic Gas, High Potential
 - 2811 Northern Great Plains Biogenic Gas , Moderate Potential (Suffield Block Analog)
 - 2812 Northern Great Plains Biogenic Gas, Low Potential
- "Southwest Montana Province (029)" by W. J. Perry, Jr.
- "Williston Basin Province (031)" by J. A. Peterson
 - a. "Williston Basin Province continuous-type plays" by J. W. Schmoker
 - 3110 Bakken Fairway
 - 3111 Bakken Intermediate
 - 3112 Bakken Outlying
 - 3113 Southern Williston Basin Margin - Niobrara Shallow Biogenic
- "Sioux Arch Province (032)" by J. A. Peterson
- "Powder River Basin Province (033)" by G.L. Dolton and J. E. Fox
 - a. Continuous-type plays:
 - 3308 Mowry Fractured Shale
 - 3311 Niobrara Fractured Shale
 - b. "Coalbed gas plays" by D.D. Rice and T.M. Finn
 - 3350 Powder River Basin - Mining-related
 - 3351 Powder River Basin - Central Basin
- "Bighorn Basin Province (034)" by J. E. Fox and G. L. Dolton
 - a. Continuous-type play:
 - 3404 Basin-Center Gas
- "Wind River Basin Province (035)" by J.E. Fox and G. L. Dolton
 - a. Continuous-type play:
 - 3505 Basin-Center Gas
 - b. "Coalbed gas play " by R.C. Johnson and D.D. Rice
 - 3550 Wind River Basin - Mesaverde
- "Wyoming Thrust Belt Province (036)" by R.B. Powers
- "Southwestern Wyoming Province (037)" by B.E. Law
 - a. Continuous-type plays:
 - 3740 Greater Green River Basin - Cloverly-Frontier
 - 3741 Greater Green River Basin - Mesaverde
 - 3742 Greater Green River Basin - Lewis
 - 3743 Greater Green River Basin - Fox Hills-Lance
 - 3744 Greater Green River Basin - Fort Union
 - b. Coal-bed gas plays:
 - 3750 Greater Green River Basin - Rock Springs
 - 3751 Greater Green River Basin - Iles

- 3752 Greater Green River Basin - Williams Fork
- 3753 Greater Green River Basin - Almond
- 3754 Greater Green River Basin - Lance
- 3755 Greater Green River Basin - Fort Union
- "Park Basins Province (038)" by C. J. Wandrey and C.E. Barker
 - a. Continuous-type play:
 - 3803 "Upper Cretaceous Niobrara Fractured Shale Oil play 3803" by R. M. Pollastro
- "Denver Basin Province (039)" by D. K. Higley, R.M. Pollastro, and J.L. Clayton
 - a. Continuous-type plays:
 - 3904 Greater Wattenberg Codell/Niobrara Oil and Gas
 - 3906 J Sandstone Deep Gas (Wattenberg)
 - 3911 "Fractured Shale - Pierre (play 3911)" by D.K. Higley and D.L. Gautier
 - 3920 Fractured Niobrara - Greater Silo/Dale Salt-Edge Oil
 - 3921 Fractured Niobrara - Greater Northern Denver Basin Oil
- "Las Animas Arch Province (040)" by C. W. Keighin
- "Raton Basin - Sierra Grande Uplift Province (041)" by C. W. Keighin
 - a. "Raton Basin coalbed gas plays" by D.D. Rice and T.M. Finn
 - 4150 Northern Raton Basin
 - 4151 Raton Basin - Purgatoire River
 - 4152 Southern Raton Basin
- "Region 5–West Texas and Eastern New Mexico" by M. M. Ball, M.E. Henry, and W.J. Perry, Jr.
 - "Pedernal Uplift Province (042)" by M. M. Ball and M.E. Henry
 - "Palo Duro Basin Province (043)" by M. M. Ball and M.E. Henry
 - "Permian Basin Province (044)" by M. M. Ball
 - "Bend Arch - Fort Worth Basin Province(045)" by M. M. Ball and W.J. Perry, Jr.
 - Continuous-type play:
 - 4503 Mississippian Barnett Shale
 - "Marathon Thrust Belt Province (046)" by W. J. Perry, Jr., and M.E. Henry
- "Region 6–Gulf Coast" by C.J. Schenk
 - "Western Gulf Province (047)" by C.J. Schenk and R.J. Viger
 - Continuous-type plays:
 - 4747 Austin Chalk - Pearsall
 - 4748 Austin Chalk - Giddings
 - 4749 Austin Chalk - Outlying
 - "East Texas Basin Province (048) and Louisiana-Mississippi Salt Basins Province (049)" by C.J. Schenk and R.J. Viger
 - Continuous-type play:
 - 4923 Cotton Valley Blanket Sandstones Gas
 - "Florida Peninsula Province (050)" by R. M. Pollastro

- "Region 7– Midcontinent" by R. R. Charpentier
- "Superior Province (051)" by J. G. Palacas
 - "Iowa Shelf Province (052)" by J. G. Palaca
 - "Cambridge Arch - Central Kansas Uplift Province (053) " by D. K. Higley
 - "Salina BasinProvince (054) Sedgwick Basin Province (059)" by S. E. Prensky
 - "Nemaha Uplift Province (055)" by R. R. Charpentier
 - "Forest City Basin Province (056)" by R. R. Charpentier
 - Coal-bed gas play:
 - 5650 "Forest City Basin - Central Basin play 5650" by D. D. Rice
 - "Ozark Uplift Province (057)" by J. R. Hatch
 - "Anadarko Basin Province (058)" by M. E. Henry and T. C. Hester
 - "Continuous-type play":
 - 5811 "Woodford/Chattanooga/Arkansas Novaculite of Midcontinent play 5811" by J. W. Schmoker
 - Prov. 59. (See Prov. 54)
 - "Cherokee Platform Province (060)" by R. R. Charpentier
 - Coal-bed gas play:
 - 6050 "Cherokee Platform - Central Basin play 6050" by D.D. Rice
 - "Southern Oklahoma Province (061)" by M. E. Henry and T. C. Hester
 - "Arkoma Basin Province (062)" by W. J. Perry, Jr.
 - "Arkoma Basin Province coal-bed gas plays" by D.D. Rice
 - 6250 Arkoma Basin - Anticline
 - 6251 Arkoma Basin - Syncline
- "Region 8–Eastern" by R. T. Ryder
- "Michigan Basin Province (063)" by G. L. Dolton
 - Continuous-type plays:
 - 6319 Antrim Shale Gas, Developed Area
 - 6320 Antrim Shale Gas, Undeveloped Area
 - "Illinois Basin Province (064)" by D. L. Macke
 - a. Continuous-type play:
 - 6407 "Illinois Basin–New Albany Shale Gas play 6407" by J. R. Hatch
 - b. "Illinois Basin Province coal-bed gas play" by D.D. Rice, T. M. Finn, and J. R. Hatch
 - 6450 Illinois Basin - Central Basin
 - "Black Warrior Basin Province (065)" by R. T. Ryder
 - "Black Warrior Basin Province coal-bed gas plays" by D.D. Rice and T. M. Finn
 - 6550 Black Warrior Basin Recharge
 - 6551 Black Warrior Basin - Southeastern Basin
 - 6552 Black Warrior Basin - Coastal Plain
 - 6553 Black Warrior Basin - Central and Western Basin

"Cincinnati Arch Province (066)" by R. T. Ryder

Continuous-type play:

6604 "Devonian Black Shale Gas play 6604" by R.T. Ryder and J.R. Hatch

"Appalachian Basin Province (067)" by R. T. Ryder

a. Continuous-type plays Clinton/Medina Gas plays: (6728 through 6731)

6728 Clinton/Medina Sandstone Gas High Potential

6729 Clinton/Medina Sandstone Gas Medium Potential

6730 Clinton/Medina Sandstone Gas Medium-Low Potential

6731 Clinton/Medina Sandstone Gas Low Potential

Upper Devonian Sandstone Gas plays: (6733 through 6736)

6733 Upper Devonian Sandstone Gas High Potential

6734 Upper Devonian Sandstone Gas Medium Potential

6735 Upper Devonian Sandstone Gas Medium-Low Potential

6736 Upper Devonian Sandstone Gas Low Potential

"Devonian Black Shale Gas plays" by R.C. Milici

6740 Devonian Black Shale Gas - Greater Big Sandy

6741 Devonian Black Shale Gas - Greater Siltstone Content

6742 Devonian Black Shale Gas - Lower Thermal Maturity

6743 Devonian Black Shale Gas - Undeveloped Northeastern Ohio and
Western Pennsylvania

b. "Coal-bed gas plays" by D.D. Rice and T.M. Finn

6750 Northern Appalachian Basin - Anticline

6751 Northern Appalachian Basin - Syncline

6752 Central Appalachian Basin - Central Basin

6753 Cahaba Coal Field

"Blue Ridge Thrust Belt Province (068), Piedmont Province (069), Atlantic
Coastal Plain Province (070), Adirondack Uplift Province (071), and New
England Province (072)" by R.C. Milici

**NARRATIVE SUMMARIES OF UNCONVENTIONAL PLAYS BY TYPE (These
summaries also have been integrated into the reports by Region and Province
above.)**

A. "Introduction to narratives for continuous-type accumulations" by J. W.
Schmoker

B. "Geologic framework and description of coalbed gas plays" by D.D. Rice
Introduction

Region 2-Pacific Coast

"Western Washington (part of Province 104)" by S.Y. Johnson and D. D.
Rice
plays 0450, 0451, 0452

Region 3-Colorado Plateau and Basin and Range

Uinta-Piceance Basin Province (020)

"Uinta Basin" by D.D. Rice, T.M. Finn, and W.B. Cashion
plays 2050, 2051, 2052

"Piceance Basin" by R.C. Johnson, D.D. Rice, and T.M. Finn
plays 2053 through 2057

"San Juan Basin Province (022)" by D.D. Rice and T.M. Finn
plays 2250, 2252, 2253

Region 4-Rocky Mountains and Northern Great Plains

"Powder River Basin Province (033)" by D.D. Rice and T.M. Finn
plays 3350, 3351

"Wind River Basin Province (035)" by R.C. Johnson and D.D. Rice
play 3550

"Southwestern Wyoming Province (037)" by B.E. Law
plays 3750 through 3755

"Raton Basin Province (041)" by D.D. Rice and T.M. Finn
plays 4150, 4151, and 4152

"Region 7-Midcontinent" by D.D. Rice, T.M. Finn, and J.R. Hatch

Forest City Basin Province (056)
play 5650

Cherokee Platform Province (060)
play 6050

Arkoma Basin Province (062)
Plays 6250, 6251

Region 8-Eastern

"Illinois Basin Province (064)" by D.D. Rice, T.M. Finn, and J.R. Hatch
play 6450

"Black Warrior Basin Province (065)" by D.D. Rice and T. M. Finn
plays 6550 through 6553

"Appalachian Basin Province (067)" by D.D. Rice and T.M. Finn
plays 6750 through 6753

Appendix E

EXPLANATION OF THE MAPPING STRATEGY USED IN PLAYS 5801, 5804, 5812 and 6101

In the Anadarko Basin and Southern Oklahoma Provinces (058 and 061), plays 5801, 5804, 5812, and 6101 each contain a number of individually mapped stratigraphic units within the framework of one play. Each play therefore contains different boundaries depending upon which stratigraphic interval is considered. Other plays in these two provinces are restricted to a single mapped stratigraphic unit stored in a single line or cell file.

The naming convention for base map and cell files for plays 5801, 5804, 5812, and 6101 is file0000x.lin for line files and file0000x.cls for cell files, where x is an alpha character designating the specific stratigraphic interval mapped. These alpha character designations or code for each stratigraphic interval are shown below:

Table 1. Stratigraphic units in play 5801 (Deep Structural Gas Play)

<u>Stratigraphic unit (approximate age)</u>	<u>Code</u>
Hunton Group (Ordovician to Devonian)	d
Viola Group (Late Ordovician)	c
Simpson Group (Middle to Late Ordovician)	b
Arbuckle and Ellenburger Groups (Late Cambrian to Middle Ordovician)	a

Table 2. Stratigraphic units in play 5804 (Wichita Mountains Uplift Play)

<u>Stratigraphic unit (approximate age)</u>	<u>Code</u>
Upper Virgilian Rocks (Late Pennsylvanian)	o
Lower Virgilian Rocks (Late Pennsylvanian)	n
Lower Missourian Rocks (Late Pennsylvanian)	m
Lower Desmoinesian Rocks (Middle Pennsylvanian)	l

Atoka Group (Middle Pennsylvanian)	k
Morrow Group (Early Pennsylvanian)	j
Springer Formation (Late Mississippian to Early Pennsylvanian)	i
Upper Mississippian Rocks (Late Mississippian)	h
Lower Mississippian Rocks (Early to Late Mississippian)	g
Woodford Shale (Late Devonian to Early Mississippian)	f
Misener Sandstone (Late Devonian)	e
Hunton Group (Ordovician to Devonian)	d
Viola Group (Late Ordovician)	c
Simpson Group (Middle to Late Ordovician)	b
Arbuckle and Ellenburger Groups (Late Cambrian to Middle Ordovician)	a

Table 3. Stratigraphic units in play 5812 (Deep Stratigraphic Gas Play)

<u>Stratigraphic unit (approximate age)</u>	<u>Code</u>
Upper Desmoinesian Rocks (Middle Pennsylvanian)	i
Lower Desmoinesian Rocks (Middle Pennsylvanian)	h
Atoka Group (Middle Pennsylvanian)	g
Morrow Group (Early Pennsylvanian)	f
Springer Formation (Late Mississippian to Early Pennsylvanian)	e
Upper Mississippian Rocks (Late Mississippian)	d
Lower Mississippian Rocks (Early to Late Mississippian)	c

Woodford Shale (Late Devonian to Early Mississippian)	b
Misener Sandstone (Late Devonian)	a

Table 4. Stratigraphic units in play 6101 (Deep Gas Play)

<u>Stratigraphic units (approximate age)</u>	<u>Code</u>
Desmoinesian Rocks (Middle Pennsylvanian)	h
Atoka Group (Middle Pennsylvanian)	g
Springer Formation - Morrow Group Rocks (Late Mississippian to Early Pennsylvanian)	f
Misener Sandstone, Woodford Shale, Sycamore Limestone (Late Devonian to Early Mississippian)	e
Hunton Group (Ordovician to Devonian)	d
Viola Group (Late Ordovician)	c
Simpson Group (Middle to Late Ordovician)	b
Arbuckle Group (Late Cambrian to Middle Ordovician)	a

Appendix F

DOCUMENTATION FOR EXPLORATION CELL MAPS

By

Richard F. Mast, William R. Beeman, and David H. Root

ASCII files having a .cls extension contain map data that display oil and gas exploration and development. They are divided into two types of files with a different set of variables for each type. The first type shows exploration and development by region and has a reg prefix before the region number (e.g. reg1.cls). The second type of file shows exploration and development by province or play and has a file or fil prefix (e.g., file0107.cls). The province files are identified by the province number followed by 00. The play files are identified by the four digit play number (e.g., file0107.cls).

The .cls files consist of a series of records, each of which contains a sequential identifying number and geographic coordinates in decimal degrees. Each record represents the center of a cell that is approximately one-quarter mile by one-quarter mile (region, province, or play maps). The geographic coordinates for the center of each cell were calculated using the program weller3.for. A commented copy of weller3.for and the associated data file clarke.dat are located in the "programs" subdirectory. The program weller3.for determined which well or wells were in a given cell and replaced the geographic coordinates of the wells with the appropriate cell center coordinates. The resultant temporary well files were then sorted by geographic location, which grouped all wells in each cell together in the well file. Well files for regions or provinces contained all the wells for that particular area. Well files for plays contained only those wells that can be identified by the bottom-hole stratigraphy as having at least penetrated the top of the play. Therefore, those wells that had no bottom-hole stratigraphic data appeared only in the region and province files. For each temporary well file, the program gridder1.for determined, for each cell, whether any exploration or production had taken place.

Regional Exploration Cell Files (reg prefix)

The data contained in the cell files with a reg prefix were calculated by Richard F. Mast and Lois P. Williams using FORTRAN programs designed by Richard F. Mast and David H. Root of the USGS. In order to determine where areas of oil and gas exploration and production had occurred, the program utilized two data sources: (1) the Petroleum Information, Inc., Well History Control System (WHCS), a database of oil and gas well information compiled by Petroleum Information Corporation; and (2) data digitized from State oil and gas maps. If WHCS contained any information within a particular cell regarding exploration, that data was used to classify the cell. However, another method was used to calculate the values of the cells in those areas known to be historically productive of oil or gas, but where WHCS data is lacking or incomplete; these are usually areas of very old production. In this second method, the missing

productive areas were digitized from State oil and gas maps and a program determined which cells fell within any field outline. If a cell fell within a digitized field, it was assigned a value based upon how the field was characterized with respect to oil and gas production on the State map. However, if a cell fell within the boundary of one of those fields, but also contained a well that had a record within the WHCS, the record from WHCS took precedence.

The large size (approximately 85 MB) of the file for the National-level exploration cell map may be inconvenient for many users, so the data have been divided into eight regional level files (reg#.cls) corresponding to the eight assessment regions. The offshore Federal waters are not strictly part of any of the eight regions. The data for the Federal waters have been separated and are available in file fedoffsh.cls, which is located in the fedoffsh directory.

Each record has 10 fields, comma-delimited. After the last record, a line occurs with a single end statement. The data in the cell files with the reg prefix have the following format:

- (1) Sequential identifying number. This number is provided as a unique identifier to each record in a file.
- (2) Longitude value of the cell center in decimal degrees. By convention, values in the Western Hemisphere are assigned a negative value.
- (3) Latitude value of the cell center in decimal degrees. By convention, values in the Northern Hemisphere have a positive value.
- (4) Exploration level. Single integer values of 1 through 9. The WHCS Initial Class well data were used to determine the exploration level for each cell. The exploration level codes for the cells and WHCS initial classes are as follows:

<u>Exploration level code</u>	<u>Equivalent WHCS initial class</u>
1 = Outpost or extension test	1
2 = Shallower pool test	2
3 = Deeper pool test	3
4 = New pool wildcat	4
5 = New field wildcat	5
6 = Development well	6
7 = Stratigraphic test, core hole, core test 7, 8, and 9 or injection well	
8 = Unclassified or service well	0
9 = Geothermal well	G

If there are several wells in a cell, the cell is assigned the lowest initial class value of any well within the cell.

(5) Production status. Single integer values of 1, 2, 3 or 4.

Production Status Code

- 1 = Cell contains at least one productive oil well, but no productive gas wells
- 2 = Cell contains at least one productive gas well, but no productive oil wells
- 3 = Cell contains at least one productive oil well and at least one productive gas well or one well producing both oil and gas
- 4 = Cell contains no producing wells

(6) Completion year. Two spaces, integer value. These values are calculated by decade. If more than one well was contained within the cell, the value was assigned from the earliest completed well within the cell (e.g., code 98 means that the earliest well in the cell was completed in the 1980's). A code of 81 (1810) indicates no data.

(7) Production year. Two spaces, integer value. These values are also calculated by decade. If more than one producing well was contained within a cell, the value was assigned from the earliest productive well within the cell, e.g. code 98 means that the earliest production was in the 1980's. A code of 81 (1810) indicates no data. Non-producing cells are coded as 10.

(8) Number of wells per cell. Single integer value.

Number of wells per cell code

- 0 = Cell contains no identified wells. Cells filled in from State oil and gas maps have this code.
- 1 = Cell contains 1 well.
- 2 = Cell contains 2 - 4 wells.
- 3 = Cell contains 5 - 8 wells.
- 4 = Cell contains 9 - 16 wells.
- 5 = Cell contains 17 - 32 wells.
- 6 = Cell contains 33 - 64 wells.
- 7 = Cell contains 65 - 128 wells.
- 8 = Cell contains 129 - 256 wells.
- 9 = Cell contains more than 256 wells.

(9) Number of producing wells per cell. Single integer value.

Number of producing wells per cell code

- 0 = Cell contains no producing wells.
- 1 = Cell contains 1 producing well.
- 2 = Cell contains 2 - 4 producing wells.
- 3 = Cell contains 5 - 8 producing wells.
- 4 = Cell contains 9 - 16 producing wells.
- 5 = Cell contains 17 - 32 producing wells.
- 6 = Cell contains 33 - 64 producing wells.
- 7 = Cell contains 65 - 128 producing wells.
- 8 = Cell contains 129 - 256 producing wells.
- 9 = Cell contains more than 256 producing wells.

(10) Total depth. Single integer value. This code represents the greatest depth recorded for any well within a cell.

Total depth code

- 0 = no value
- 1 = 1 - 1,000 feet
- 2 = 1,001 - 2,000 feet
- 3 = 2,001 - 4,000 feet
- 4 = 4,001 - 8,000 feet
- 5 = 8,001 - 12,000 feet
- 6 = 12,001 - 16,000 feet
- 7 = 16,001 - 20,000 feet
- 8 = greater than 20,000 feet

Province and Play Exploration Cell Files (file or fil prefix)

The data contained in the files with a file or fil prefix were also calculated by Richard F. Mast and Lois P. Williams using FORTRAN programs designed by Richard F. Mast and David H. Root of the USGS. This program utilized only data from the Well History Control System of Petroleum Information Corporation. Each province geologist involved in the National Oil and Gas Assessment specified the stratigraphic intervals involved in each of his or her plays. WHCS data were used to determine those cells that contained wells penetrating the top of the specified stratigraphic interval, and also to determine those cells producing from the specified stratigraphic interval. It was assumed that a well that penetrated any formations below those in the specified stratigraphic interval also penetrated the formations of the specified interval.

Each record has four fields, comma-delimited. After the last record, a line occurs with a single end statement. The data in the cell files with the file or fil prefix have the following format:

- (1) Sequential identifying number. This number is provided as a unique identifier to each record in a file.
- (2) Longitude value of the cell center in decimal degrees. By convention, values in the Western Hemisphere are assigned a negative value.
- (3) Latitude value of the cell center in decimal degrees. By convention, values in the Northern Hemisphere have a positive value.
- (4) Production Status. Single integer values of 1, 2, 3 or 4.

Production status code

1 = Cell contains at least one productive oil well from the stratigraphic interval, but no productive gas wells

2 = Cell contains at least one productive gas well from the stratigraphic interval, but no productive oil wells

3 = Cell contains at least one productive oil well and at least one productive gas well from the stratigraphic interval or one well producing both oil and gas from the stratigraphic interval

4 = Cell contains wells that penetrated formations stratigraphically in or below the specified interval, but contains no wells producing from the stratigraphic interval